REMARKS

These remarks follow the order of the paragraphs of the office action. Relevant portions of the office action are shown indented and italicized.

DETAILED ACTION

> *1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).*
>
> *Misnumbered claims 24-29 have been renumbered 23-28, since there is no claim 23 filed in the amendment.*

In response, the applicants respectfully states that the claims are amended so that claims 24-29 have been renumbered 23-28.

Claim Rejections - 35 USC § 112

> *2. The following is a quotation of the second paragraph of 35 U.S.C. 112:*
>
> *The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.*
>
> *3. Claims 1-10 and 16-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.*
>
> *The instant independent claims 1 and 6 are still confusing as to what applicant regards as his/her invention. A reading of independent claim 1 fails to provide a clear picture of the invention since the structure claimed and the functions attributed to said structure is vague and indefinite. For instance, lines 11-12 suggest that "a storage part" records and stores the acoustic data, but later in the sentence it suggests the acoustic data is collected "Via said sound reflecting element". It is questioned what structure "the reflecting element" or "the storage part" actually collects the acoustic data. Further in the claim, with respect to the claimed 'sound source localization part' there is no antecedent language that suggests the "delay information" is superposed on the*

"acoustic data". Further, it is questioned what "part" is attributed to the "storage" and "sound source" (lines 11 and 13, respectively).

The method claim 6 fails for the same reasons as noted above with respect to claim 1.

In response, the applicants respectfully states that... ... .

Dependent claims 2-5, 7-10 and 16-27 are further rejected as indefinite since they depend upon indefinite claims.

In response, the applicants respectfully states that... ... .

In claim 28, it is vague and indefinite how the claimed "reflecting surface as an enveloping surface of a spheroid" is formed.

In response, the applicants respectfully states that claims 1, 6 and 28 are amended to overcome the rejections of Claims 1-10 and 16-28 under 35 U.S.C. 112, second paragraph. These are all definite and particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim Rejections -35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not Identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 28, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Afendykiw et at ('514) in view of Kobayashi et al ('019).

In response the applicants respectfully state that exception is taken with the alleged obviousness of claim 28 by Afendykiw combined with *Kobayashi*. The present invention as claimed in claim 28,

> "Enables the estimation of a sound source position at an angle in a system with a small number of microphones, which was conventionally difficult to perform, and improve the precision of estimating the sound source position. By forming a reflecting surface RS as an enveloping surface of a spheroid in which a position of sound collecting means and a sound source position are the focal points, a major reflected wave having a delay amount corresponding to a sound source position is generated, and the delay amount between the direct wave and the reflected wave is checked, whereby the sound source position is acquired and estimated."

Whereas the cited reference to Afendykiw is entitled, "BISTATIC PASSIVE RADAR, the Afendykiw abstract reads,

> "A radar system for determining the position of a target using a radio frequency source of opportunity. The system uses an interferometer antenna and cross-correlation techniques to measure the time delay in receiving a reflected signal from the target as compared to receiving a direct signal from the signal source. Thereby, the distance from the RF source via the target to the antenna is determined. Additionally, the system uses a plurality of interferometer antennas and cross-correlation techniques to measure the relative phase difference between the signals received by the antennas. Thereby, the angle of arrival of the reflected signals from the target is determined. Combining the range and angular information locates the target."

Thus Afendykiw is concerned with the position of a target using a radio frequency source of opportunity. Afendykiw is not concerned with measurement or estimation of a sound source position at an angle in a system with a small number of microphones. Claim 28 as amended reads:

> 28. A position location method comprising enabling estimation of a sound source position at an angle in a system with a small number of microphones, the step of enabling comprising:

forming a reflecting surface as an enveloping surface designed as an envelope made from at least one ~~of a~~ spheroid formed by rotating at least one of ellipse having two focal points corresponding to the sound source and the sound collecting mean respectively,

in which a position of sound collecting means and a sound source position are the focal points;

generating a delay amount corresponding to a sound source position of a reflected wave of a direct wave;

measuring the delay amount between the direct wave and the reflected wave; and

acquiring the sound source position from the result of the step of measuring.

A review of Afendykiw shows that although Afendykiw is concerned with a delay measurement, the measurement is for RF and fails to make the elements of claim 28 obvious. Afendykiw fails to teach or concern with:

any sound source localization method;
any acquisition of position of a sound source;
any collecting of acoustic data;
any acoustic data with delay information;
any position between a sound source and sound collecting means;
employing a sound reflecting element;
any reflecting surface of a sound reflecting element;
a plurality of ellipses;
ellipse focal points;
any sound reflecting element designed as an envelope made from a plurality of spheroids formed by rotating a plurality of ellipses having two focal points;
any focal points corresponding to a sound source and a sound collecting mean; or
any axis connecting of focal points;
storing collected acoustic data in a storage part;
reading acoustic data;

superposing delay information superposed on acoustic data; or

acquiring any relative position of a sound source designated by delay information.

Afendykiw certainly doesn't teach, allude to or make obvious any of the steps of claim 6. Thus claim 6 and all claims that depend upon claim 6 are allowable over Afendykiw

The further cited art to Kobayashi, US Patent 6,862,019, filed: February 6, 2002, is entitled: "Coordinate input apparatus, control method therefor, and computer-readable memory". The abstract reads: "A signal waveform detection circuit detects the three-dimensional coordinate value of an indicating tool which is defined in the first, second, and third dimensions. An arithmetic control circuit compares the coordinate value in the first dimension of the three-dimensional coordinate value with a predetermined value, and controls outputting of the coordinate values in the second and third dimensions on the basis of the comparison result."

Afendykiw with Kobayashi are in differing arts and can't be combined for an obviousness rejection. There is no reason for one skilled in either the art of Afendykiw, or the art of Kobayashi to combine Afendykiw with Kobayashi except in an effort to use hindsight in an attempt to form the elements of claim 28. This is not allowed in a 103 rejection. Moreover, a review of the cited portions of Afendykiw with Kobayashi copied below fails to support the contention that the combination makes claim 28 obvious.

> *Afendykiw et al discloses a position location method (see col. 2, lines 11-25) which "forms" a spheroid reflecting surface and measures the delay between a reflected wave and a direct wave to thereby determine the position of an RF source.*
>
> *The difference between claim 29 and the method disclosed by Afendykiw et al lies in the claim is directed to an acoustic system whereas Afendykiw et al is directed to an RF system. Specifically, Afendykiw et al locates an RF source and the instant claim locates an acoustic source.*

The cited Afendykiw portion col. 2, lines 11-25 reads:

Cross-correlating the directly received signal with the signal reflected from the target will result in a cross-correlation peak whose position on the display 62 will give the time delay between the two signals and indicate target detection. Knowing the time delay and the velocity of the radio frequency signals the range difference between the direct path 18 and

the scattered paths 20 and 22 is easily obtained using simple mathematics and, therefore, will not be discussed. Likewise, if the separation between the receiver and the RF source 10 is known, the total scattered path; i.e., the sum of path 20 and 22 can be obtained. This sum locates the detected target somewhere on the surface of an imaginary prelate spheroid, with the transmitter and the receiver located at the foci of the spheroid

The Office Communication continues.

Kobayashi et al teaches (col. 8, lines 39-58 and col. 10, lines 35-45) using reflected and direct acoustic waves to locate a sound source where the sound is reflected off a reflecting surface (5).

The cited Kobayashi portion col. 8, lines 39-58 reads:

As described above, unlike the first embodiment, the second and third embodiments are configured to calculate a distance from the phase information of a signal waveform, and hence can measure a distance with a higher precision.

The detection point of a phase delay time in the third embodiment is located closer to the head portion of a detection signal waveform 53 or 73 than that in the second embodiment. With this arrangement, the influence of reflected waves can be further reduced. More specifically, as shown in FIG. 13, when a sound wave is emitted into the air, if a reflecting surface (the display 6 serving as a coordinate input surface in FIG. 13) exists, the direct wave that strikes the sensor 3 from the sound wave generator 43 and the reflected wave that strikes the sensor 3 through the reflecting surface are detected with a time delay corresponding to the difference in length between the paths of the direct wave and reflected wave. To avoid the influence of this reflected wave, the detection points for the group delay time Tg and phase delay time Tp are preferably set closer to the head portion of the signal waveform of the direct wave.

The cited Kobayashi portion col. 10, lines 35-45 reads:

As described above, if at least three of the distances from the sound wave generator 43 to the sensors 3_Sa to 3_Sd can be measured, the position (space) coordinates of the sound wave generator 43 can be easily obtained. In the present invention, four sensors are used.

For example, the information obtained by the sensor located at the largest distance is not used (in this case, the signal output from the sensor 3 has the lowest signal level because it is located at the largest distance), and coordinates are calculated by using only the three remaining pieces of distance information, thereby allowing coordinate calculation with high reliability.

These The Office Communication continues.

In view of the use of reflecting surfaces for determining sound source locations, as taught by Kobayashi et al, it would be obvious to one of ordinary skill in the art to utilize the method disclosed by Afendykiw et al for locating a sound source.

In response, the applicants respectfully states that although the lengthy bcited portions employ words and/or phrases as in 28, these don't show the particular elements of 28:

There is apparently no showing of a combination of:

any position location method comprising enabling estimation of a sound source position at an angle in a system with a small number of microphones,

forming a reflecting surface as an enveloping surface designed as an envelope made from ANY spheroid formed by rotating any of ellipse having two focal points corresponding to the sound source and the sound collecting mean respectively,

ANY CONCERN of a position of sound collecting means and a sound source position are the focal points;

ANY generating a delay amount corresponding to a sound source position of a reflected wave of a direct wave;

measuring the delay amount between the direct wave and the reflected wave; or

ANY acquiring the sound source position from the result of the step of measuring.

Thus claim 28 and 1-27 are allowable at least as amended.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action: Accordingly, THIS ACTION IS MADE FINAL, See MPEP § 706.07(a).

Applicant respectfully requests the removal of the FINAL status in as much as the communication cites new art apparently not based on applicant's previous response.

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Respectfully submitted,

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